Evolved Medical Microgravity Suction Device

(Technology Number 162-PS)

Technology Need

- Credible accidents in space may result in chest trauma, pneumothorax or decompression
- Common complication of chest trauma is collapsed lung, with air and blood entering pleural cavity
- Treatment requires insertion of tube into pleural cavity and attaching thoracic drainage device with suction source
- Currently no thoracic drainage system and suction capability that can function in space operational environment

Technology Concept

- Prototype incorporates specially designed, passive fluid management via surface tension
- Unique properties of biological fluids and variable entrained liquid flow complicate problem
- Analysis and previous aircraft parabolic flight experiments have refined design

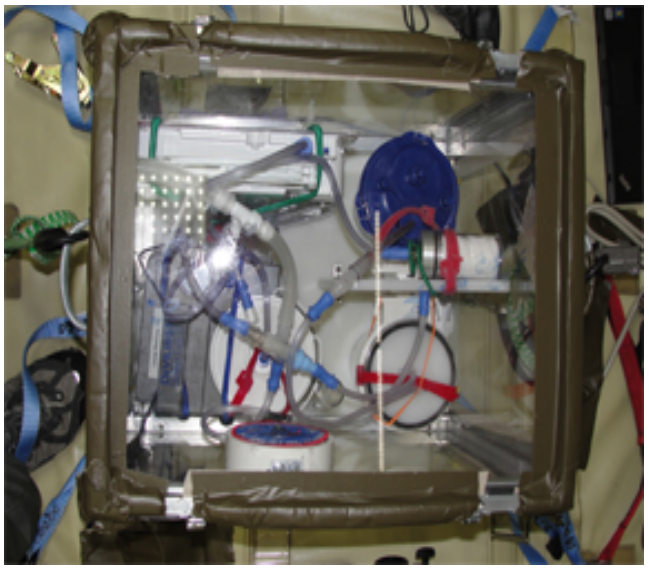
Technology Development Team

PI: Charles Marsh Cuttino, MD
Orbital Medicine, Inc

Test Apparatus

- Test apparatus includes prototype microgravity suction system and pneumothorax simulator
- Apparatus mounted inside cube shaped frame
- Video system will document operation of device during flight

- Payload size/weight 66cm cube/26kg



Flight Requirements/Objectives

- Validate 2 phase microgravity separator

- Validate function of prototype device in microgravity environment

- One suborbital, microgravity flight, providing approximately 4.5 minutes of microgravity

Technology Advancement

- Successful completion of flight planned for technology prototype will confirm operation of device refinements resulting from previous aircraft parabolic flights

- Verify design to advance to TRL6

Technology End Users

- Human exploration missions in microgravity

- Enables 1g device that can provide chest drainage and suction for use in remote or austere environments or during medical transport of casualties or accident victims

Technology Area: TA6 Human Health, Life Support, and Habitation Systems

August 2016